

Transportation Technical Work Group
Summary List of Recommended High Priority Mitigation Options

#	Mitigation Option Name	Straw Proposal Development Status
T-1	Transit, Ridesharing, and Commuter Choice Programs (originally 5.2, 5.3, and 5.6)	Ready for CAT Review
T-2	State, Regional, and Local VMT and GHG Reduction Goals and Standards (originally 4.4 and 5.10)	Reviewed and affirmed by CAT during Aug 7 meeting
T-3	Transportation Pricing (originally 5.7, 5.9, and 5.12)	Ready for CAT Review
T-4	Promote Compact and Transit-Oriented Development (originally 4.1)	Reviewed and affirmed by CAT during Aug 7 meeting
T-5	Quantification of GHG Impacts of Transportation Plans, Programs, and Projects (originally 5.11)	Reviewed and affirmed by CAT during Aug 7 meeting
T-6	Improvements to Freight Railroads and Intercity Passenger Railroads (originally 6.1 and 6.2)	Reviewed and affirmed by CAT during Aug 7 meeting
T-7	Diesel Engine Emission Reductions and Fuel Efficiency Improvements (originally 1.3 and 1.4)	Reviewed and affirmed by CAT during Aug 7 meeting
T-8	Local Transportation Financing Tools and Bicycle and Pedestrian Infrastructure Improvements (originally 5.4 and 5.5)	Reviewed and affirmed by CAT during Aug 7 meeting
T-9	Transportation System Management (originally 5.1)	Ready for CAT Review
T-10	Incentives to Promote Low-GHG Vehicle Technologies (originally 1.5)	Ready for CAT Review
T-11	Low Carbon Fuel Standard (originally 3.1)	Reviewed and affirmed by CAT during Aug 7 meeting
T-12	Zero Emission Vehicle Standards	Reviewed and affirmed by CAT during Aug 7 meeting

Options previously reviewed and affirmed by the CAT are available on the CAT website under the most recent meeting of the Transportation TWG.

http://www.ecy.wa.gov/climatechange/cat_twg_trans.htm

Mitigation Option T-1: Transit, Ridesharing, and Commuter Choice Programs

Based on Transportation Catalog Option 5.2, 5.3, and 5.6

Mitigation Option Description

The goal of this set of activities is to have the state provide the leadership and resources necessary to help create a transit and ridesharing system that connects activity centers on both an intra- and an inter-regional basis. Success at meeting the overall emissions reductions goals for 2020, 2035, and 2050 will require that substantial reductions be made in emissions from personal transportation. This will require that the state develop a reliable funding system that allows for near-term success and long-term major investments with the flexibility to invest in any type of solution. The set of activities and investments represented here attempts to reflect the diversity of needs across the state: what works in dense urban areas will be different than what is effective in low-density suburban or rural areas. The transit capital, operating support, ridesharing and trip reduction strategies assembled allow for local needs to drive the process. This option is related to options T-4 and T-8.

Mitigation Option Design

Transit - Capital

- Park and ride capacity (new and expansion), Bus rapid transit, Vehicles, Passenger facilities (multi modal terminals, shelters)
- Technology improvements (real-time customer information, signal preemption.)
- Expansion of Operations and Maintenance facilities
- Pedestrian, bicycle, and bus stop accessibility and safety projects

Transit – Operating

- Provide operating support to local transit agencies,
- Improve access within and between centers,
- Provide new service for developing areas, Provide assistance to rural areas,
- Increase resources available to elderly and disabled population,
- Provide funding for promotion of use of transportation alternatives

Transit – Funding

- Increase Regional Mobility Grant state program from \$40 million per biennium to \$100 million per year,
- Increase funding to ensure the mobility of persons with special transportation needs

Provide funding for major investments in high capacity transit to match local and regional investments.

Ridesharing – Capital

- Meet vanpool fleet expansion needs of local service providers and provide funding for service and replacement of vans,
- Create and maintain a state of the art ridematching system,

Ridesharing – Operating

- Fund ongoing statewide promotions, including incentives to employers and individuals,
- Create statewide marketing program to promote carpooling through education and incentives,
- Fund incentives, including subsidized transit and vanpool fares for all State employees.

Ridesharing – Cost

- Increase annual state funding from \$8 million per biennium to \$15 million per biennium.

Commuter Choice – Operating

- Increase state CTR program statewide with emphasis on direct employer support, promotion, and incentives,
- Implement Growth and Transportation Efficiency Centers in all designated urban centers,
- Expand rideshare tax credit for employers that start employee incentive programs and retailers that reward customers who rideshare for shopping trips,
- Provide incentives to employers to allow telecommuting,
- Implement major initiative to reach travelers at the home end of the trip: mobility education for 600,000 households per year for 10 years. This approach is critical to creating change in low density residential and employment areas across the state.

Commuter Choice – Cost

- \$10 million for CTR, \$10 million for GTEC, \$6 million for residential programs

Goals:

- Increase transit trips and transit market share as indicated in the following table.
- Increase rideshare trips and market share as indicated in the following table.

	PSRC	Spokane	Tri-Cities	Vancouver	Rest of State
Transit					
2005 trips					
2005 mode share					
2020 trips (baseline)					
Goal: 2020 trips					
Goal: 2020 mode share					

Rideshare					
2005 trips					
2005 mode share					
2020 trips (baseline)					
Goal: 2020 trips					
Goal: 2020 mode share					

Timing: See above.

Parties Involved: Transit Agencies, State of Washington

Implementation Mechanisms

TBD

Related Policies/Programs in Place

[Insert text here]

Mitigation Option T-3: Transportation Pricing

Based on Transportation Catalog Option 5.7, 5.9, and 5.12

Mitigation Option Description

Growing traffic congestion, particularly in the urban areas of our state, causes reduced fuel efficiency and increases emissions of greenhouse gases as well as criteria pollutants. The way we pay for transportation influences our decisions on when, where, and how we travel – or don't travel. A major reason for congestion is that there is little relationship between how a person travels and the cost (personal, social, and environmental) of that travel. Pricing sets a direct economic relationship between the costs and benefits of when, where, and how a person travels; by doing so, pricing manages demand and increases the efficiency of the transportation system and reduce adverse environmental impacts. When variable costs of automobile travel are comparatively low, transit and ridesharing have difficulty competing.

Pricing works on the principle of supply and demand. Congestion occurs when demand is so high that the system can no longer efficiently handle the amount of traffic. Roadway pricing introduces or expands the use of user fees linked to existing congestion conditions to manage demand. As demand increases for a facility or service, the cost for that facility or service increases. With a cost associated with the use of a facility, travelers begin to think and react more to when, where, and how they travel. Travelers will alter their travel, reducing the demand for the facility or service and thus enable it to operate at an efficient level. For example, peak-period pricing for air travel has become one of the most significant methods to balance supply and demand by encouraging travelers to alter their travel schedules. Other forms of transportation pricing work on similar principles, seeking to limit demand and maximize efficiency by sending more explicit price signals to users. While applying pricing to surface transportation is a recent development, pricing has been used successfully in other public service sectors such as water and electricity.

This option seeks to promote several forms of transportation pricing in both the near and longer term. Near-term options include:

- Expanded use of HOT (High Occupancy Toll) lanes
- Use of tolling to manage demand in selected corridors, including both dynamic and fixed tolling
- Start a mileage-based insurance pilot program
- Increases in parking prices and other forms of parking supply management

Longer-term options include:

- Implementation of system-wide dynamic roadway pricing in major urban areas
- Broad offering of mileage-based insurance throughout the state
- Exploration of mileage-based vehicle pricing, greenhouse gas emissions pricing and vehicle weight charges. As vehicles using alternative fuels, such as biofuels and electricity, become increasingly available, there will be a need to replace lost gas tax revenues. Additional sources of revenue should not discourage alternative fuels. Oregon is experimenting with mileage based revenue, but other systems need to be explored.

Funds generated by roadway pricing should be used to support alternative modes of regional transportation.

Mitigation Option Design

Near-term goals:

- Implement HOT lanes in SR 167 corridor as planned. Explore implementation of HOT lanes on I-405 and conversion of Puget Sound HOV system to HOT lanes.
- Use tolls to manage demand in SR 520 corridor and other corridors as appropriate (dynamic and fixed tolls).
- Expand King County mileage-based insurance pilot program to cover XXX vehicle owners by 2010.
- Implement 5% parking surcharge in the Puget Sound region (except Seattle, where a 5% parking tax took effect July 6, 2007). Increase to 10% by 2009.
- By 2010, ensure that 50% of employers who provide leased parking spaces to employees will offer parking cash-out.
- Develop or improve tools that can be used to evaluate pricing options.

Longer-term goals:

- By 2015, use dynamic pricing to manage demand on highway system throughout the Puget Sound region.
- By 2020, 50% of vehicles owners in state will be offered mileage based insurance.

Timing: See above.

Parties Involved: WSDOT, RTPOs, counties

Implementation Mechanisms

TBD

Related Policies/Programs in Place

- HOT (High Occupancy Toll) or Express Toll Lanes. In April 2008, WSDOT will begin operations of the first HOT Lane in the state. The SR 167 corridor is heavily congested, but has excess capacity in the HOV (High Occupancy Vehicle) Lane. The HOT Lane will allow non-HOV drivers to use the lane for a fee. The fee will be variable, changing based on the travel conditions and amount of capacity available in the HOT Lane. By managing the amount of vehicle in the lane through price, the HOT Lane will maintain transit, vanpool, and carpool travel times within the corridor, increase the efficiency of the lane, and increase vehicle efficiency.

WSDOT is exploring the use of HOT or Express Toll Lanes on I-405 as well as conversion of the existing HOV system within the Puget Sound.

- Corridor Pricing. The Lake Washington Urban Partnership proposal between WSDOT, King County, and the Puget Sound Regional Council are exploring the potential of tolling the SR 520 corridor, prior to construction, to test the use of tolling, technology, transit, and teleworking to reduce congestion within the corridor. King County, the Washington State Department of Transportation and the Puget Sound Regional Council are seeking a U.S. Department of Transportation Urban Partnership Grant that would include The Lake Washington Urban Partnership proposal. An announcement on the grant application will be made in early August.
- Mileage based insurance. King County is beginning a research project to test the potential for mileage based insurance with Unigard Insurance. The study will explore how insurance priced on when, where, and how you drive will influence driver behavior.
- PSRC recently conducted a pilot test of an in-vehicle taxi-like metering device to assess roadway user charges. This Traffic Choices Study involved 500 vehicles from more than 300 households.
- On July 6, 2007, the City of Seattle implemented a 5% parking tax. The tax will go up to 7.5% on July 1, 2008 and up to 10% on July 1, 2009. Drivers who rent parking stalls by the month, residential parking spots, and parking on city streets are not affected by the new tax.

Mitigation Option T-9: Transportation System Management

Based on Transportation Catalog Option 5.1

Mitigation Option Description

Transportation System Management is an interactive approach that allows transportation agencies to actively manage the transportation system to increase the efficient operations of the system and gives users better options in choosing paths that best work for them. This approach incorporates increased system performance, reliability, and safety. The result will be reduced congestion, creating smoother flows, reducing idling, and allowing more efficient vehicle operation on our roadway networks, thereby reducing emissions of GHGs as well as other pollutants.

Effective Transportation System Management requires the development of specific benchmarks and goals that establish definite improvements to better move people and goods throughout the state, with associated funding packages and programs to accomplish them. The greater the efficiency in the movement of people and goods, the greater the greenhouse gas benefit and connection within our economic systems.

This option overlaps with Option T-3, Transportation Pricing.

Mitigation Option Design

A successful Transportation System Management package will include funding and implementation of a broad array of driver communication, accident response systems, speed reduction, and other strategies that will reduce congestion on our existing network, in addition to expanding and connecting important pieces of the network to function better as a whole. While some of these strategies are applicable in urban areas only, others can be applied in both urban and rural areas, wherever there might be congestion, extra need for traveler information, or special conditions such as major construction or seasonal traffic issues.

This option involves the following strategies.

- **Active Traffic Management.** The real-time variable control of speed, lane movement, and traveler information within a corridor and can improve traffic flow in the corridors where it is applied, including:

Speed Harmonization/Queue Warning/Lane Control - the ability to smooth traffic flows and speeds as vehicles approach congested areas and reduce the speed of vehicles as they approach queues. In Europe, this strategy has been shown to reduce both primary and secondary accidents, reducing non-recurrent congestion. It has also

been found to reduce congestion, queuing, and improve throughput. Speed control allows the highway to continue operating nearer to its highest throughput capacity as volumes increase.

Specific performance measure is “increase operating speed for congested areas”. Anticipated investment level to achieve it is medium.

Traveler Information and Dynamic Re-Routing - providing Traveler Information opportunities including travel times and the availability of alternative routes around incidents and congested areas; dynamic re-routing allows WSDOT to affect the driver decisions of those unfamiliar (and familiar) with the area by modifying destination guide-signs.

Specific performance measure is “reduction of delay” (time) from one destination to another. Other measures may include how much time it takes to change signals across various jurisdictions/alter signal timing dynamically for city streets. Anticipated investment level to achieve it is medium.

Overall, benefits of Active Traffic Management are reduced overall delay, reduced idling, and fewer secondary accidents which will also reduce delay and idling. Again, anticipated investment level to achieve it is medium.

- **Reduce Speed Limit on Freeways and Highway.** Reducing speed limits to 55 miles per hour on freeways and highways will improve fuel economy for vehicles by an average of XX% for roadways currently posted at 70 mph and YY% for roadways currently posted at 60 mph. It will also reduce the number and severity accidents that block/congest traffic due to improved driver reaction time and reduced impacts.

The savings of greenhouse gas emissions will vary depending on the amount of law enforcement. Enforcement typically includes increasing the presence of officers/patrol vehicles and higher rates of ticketing high speed drivers. Additional enforcement may possible through automated cameras with photo flash capability to electronically capture and fine speeding vehicles. The photo flash method of enforcement will need state legislative approval and program funding to accomplish.

Specific performance measure is speed and number of tickets issued compared with previous years adjusted for population. Results may include increase travel times which could result in fewer vehicle trips or a reduction in VMT (for example, a driver may say “I’m going shopping closer to home because it will take too long to get to the Mall”). Anticipated investment level to achieve is low to medium depending on enforcement mechanisms.

- **Traffic Management Center(s).** Provides centralized data collection, analysis, and real-time management of the transportation system. System management decisions are based on in-road detectors, video monitoring, trend analysis, and incident detection.

Specific performance measures are response time to incidence, how quickly problems are identified and responded to and restored to normal, reduced idling time, reduction of secondary accidents. Major Washington urban areas already have some traffic

management centers, but to accomplish the various strategies listed in this document, further equipment and staffing investment is needed in coordination with state and local jurisdictions and link established management centers together. Anticipated investment level to achieve is low to medium.

- **Traffic Signal Synchronization.** The timing and operations of the traffic signal operations are synchronized to provide an efficient flow or prioritization of traffic, increasing the efficient operations of the corridor and reducing unwarranted idling at intersections. The system can also provide priority for transit and emergency vehicles.

Specific performance measurements are “delay” and “idle time”. Anticipated investment level to achieve is fairly low, though development of concurrent local jurisdiction support and coordination may raise the cost to medium.

- **Managed Lanes** are lane(s) which have special operational characteristics and restrictions that are intended to manage the operations of the lane(s). Management of the facility is typically a combination of physical design which limits access and regulation, and may include pricing. Examples are:

High Occupancy Vehicle (HOV) lanes – are lane(s) exclusively used by transit, vanpools, and vehicles with a minimum number of occupants (typically a minimum of two or three). Full funding for the completion of the system is needed. In addition, periodic re-examination of the system will allow for improved use by deciding which areas should be maintained at 2+ vehicle capacity vs other locations that would be better served with 3+ vehicle capacity requirements where demand is high and where further extensions of HOV facilities would best serve the traveling public.

Reversible Express Lanes – Lane(s) that change directions during peak periods to manage peak demand periods.

Direct Access Ramps – Highway ramps which provide direct access to a managed lane. An example is a direct access ramp that links a HOV lane to a park & ride facility.

Ramp Bypass Lane – A lane that provides priority bypass of ramp meters for vehicles.

Truck Only Lanes – a lane(s) exclusively used for trucks.

Transit Only Lane or Bus Ways – a lane(s) exclusively used for transit.

Green Lanes – a lane(s) exclusively used for vehicles which meet specified environmental impact levels.

Limited Access Highways – are highways with limited access points.

High Occupancy Toll (HOT) or Tolled Express Lane – Lane(s) that charges tolls as a means of regulating access to or the use of the facility, to maintain travel speed and reliability. This type of facility will need additional evaluation to assure a balance between social justice in the use of the lanes. Social justice may be achievable through use of the collected fees to go back into the system to improve transit service

for low income areas, improvements areas with high traffic demand, and the overall transportation corridor that the HOT lane(s) serves.

Specific performance measure is “delay”, “average operating speeds”, and “person through-put” and “VMT reduction” depending on facility type and improvement. Anticipated investment level to achieve is medium for conversion of existing lanes and high for construction of new lanes.

- **Pricing.** (Relates to Option T-3) The use of direct user fees (tolls) to manage demand on the transportation system. We recommend that strategies include a mix of the following options.

Fixed – the toll is fixed and may vary by vehicle class or other set distinguishers.

Time of Day Schedule – the toll varies by time of day, rising during set peak periods and lowering during non-peak periods.

Dynamic or Variable – the toll changes to maintain a set operation performance based on real time traffic conditions. As congestion builds, the toll increases to reduce demand. The toll will rise to the point where it begins to influence drivers decisions to use the facility at that time. Additionally, trend analysis can be used to augment real time data to anticipate congestion and proactively adjust tolls.

Electronic Tolling – Tolls are collected electronically at travel speed, no toll booths or delays. Tolls can be collected through electronic transponders installed in the car or by video license plate recognition.

Specific performance measure may include “delay”, “person-throughput”, “use/traffic counts during off-peak periods”. Anticipated investment level to achieve is high based on infrastructure needs to achieve.

- **Increase Incident Response opportunities** – detection, assistance, and clearing of incidents on the highway so as to assist travelers, increase safety, and reduce non-reoccurring delay caused by incidences. This strategy is best served on limited access roadways where it is hard for drivers to find an alternative route to their destinations. However, perhaps expand incidence response activities to high volume and accident prone local streets and major arterials if appropriate.

Specific performance measures are “response time to the scene”, “time needed to clear an incident”, “delay”, and reduced “idle time”. Anticipated investment level to achieve is low.

- **Provide Additional Traveler Information** - providing real time and projection of travel conditions and transit information to the public to aid in their decision about how, when, and where to travel.

Specific performance measure is “delay” and “speed/travel time”. Anticipated investment level to achieve is low.

- **Increase number of multi-modal connection points.** Co-location of bus, ferry vessel and light-rail terminals would encourage more walk-on passengers. Improved

system of coordinating the different regional bus transit systems so that the transfer from one system to the other is seamless (this is an issue of scheduling and location of stops).

Specific performance measures are transit patronage/ridership, mode choice, travel times on transit, wait times between modes – overall outcome “reduced VMT”. Anticipated investment level to achieve is high due to increase trip frequency for bus services and other infrastructure development needs.

Note: this measure has a connection with land use decisions and accessibility of land uses to transit. So it potentially overlaps with options T-1, T-4, and T-8).

- **For Washington State Ferries and consideration for WSDOT Eastern Region Ferry (Keller Ferry).** Optimize efficiency in operations, scheduling and/ or varying vessel size based on demand at different times of the day on a route, as currently seen in bus system management. This includes identifying and implementing feasible changes in vehicle loading/ unloading procedures, traffic lane configuration, off terminal signal management, sailing frequency and crossing time, and, vessel speed control/optimization to reduce GHG emissions.

Specific performance measures are delay (gate times) and total fuel consumption by vessels. Anticipated investment level to achieve is medium to high.

Goals: Overall the goal of this option is to effectively implement a package of Transportation System Management strategies to reduce annual congestion delay and increase human through-put as follows.

- In the PSRC region, reduce 2020 highway delay XX%, from YY hours per year (baseline) to ZZ hours per year compared with no action scenarios.
- In other metropolitan areas in the state, reduce 2020 highway delay XX% compared with no action scenarios.
- In rural areas of the state, reduce 2020 highway delay to the extent possible (no numeric goal established).

Timing: Implementation of many of these strategies is already underway. Full implementation targeted for 2020.

Parties Involved: Application to freeways, US roadways, and State Roads (highways) involves a mixture of oversight by the Federal Highway Administration and others within US Department of Transportation like Federal Transit Administration, Washington State Legislature, and Washington State Department of Transportation

Roadway networks within unlimited access locations (for example city streets, county roads) are under the jurisdiction of City Councils, Mayors, Public Works Departments, County Councils, and County executives.

Ferry options involve Washington State Ferries/Washington State Department of Transportation and the Washington State Legislature, and appropriate labor unions.

Multi-modal options include rail operators, Washington State Ferries/Department of Transportation, transit agencies, city and county governments.

Implementation Mechanisms

Possible mechanism includes the federal funding in Urban Partnership Grants.

http://ops.fhwa.dot.gov/tolling_pricing/value_pricing/resources/documents/upa.htm

Related Policies/Programs in Place

Washington Transportation Plan policies for preservation and for environmental quality and health : http://www.wsdot.wa.gov/NR/rdonlyres/083D185B-7B1F-49F5-B865-C0A21D0DCE32/0/FinalWTP111406_nomaps.pdf

System efficiency and tolling studies <http://www.wstc.wa.gov/Tolling/default.htm>

Mitigation Option T-10:

Actions to Accelerate and Integrate Plug-In Hybrid Electric Vehicle Use

Based on Transportation Catalog Option 1.5

Mitigation Option Description

Plug-in hybrid electric vehicle technology (PHEV) offers one of the best opportunities to reduce transportation carbon dioxide emissions in a cost effective way. Smart integration of PHEVs into the electric power grid and into the transportation system can provide significant additional reductions. Coupling biofuels with PHEVs would further enhance the capability of PHEVs to lower GHG emissions.

The goal of this option is provide a set of actions that would accelerate the deployment of this technology, remove barriers to more rapid adoption, create initial incentives and provide for the integration of PHEVs with other systems, including the power system and the transportation system.

Mitigation Option Design

The Legislature provided initial funding for a Washington State PHEV pilot project, which could be expanded to design a more comprehensive set of measures to accelerate and integrate the deployment of PHEVs. This mitigation options would include the following actions:

- Achievement of a targeted percentage [to be determined] of plug-in hybrid electric vehicles on Washington state roads starting in 2010 and increasing to 2020. To help initiate and accelerate PHEV purchases, goals for Washington state agency fleet purchases and local government purchases of PHEVs would be set on an increasing schedule.
- Integration and coordination with electric utilities to ensure that recharging of PHEVs is accomplished at off peak times and in a manner that would also assist in the integration of intermittent wind power and other renewable power that is under other mandates. This would require testing and establishing standard communication protocols and technology, whether by power line communication, wireless, smart metering or combinations.
- Testing and deployment of Vehicle to Grid technology (V2G) that would potentially provide for power back to the grid at peak times and for ancillary services. Testing of use of PHEVs for back up storm power for individuals would also be tested.
- Integration with transportation system planning, such as the provision of recharging stations at park and ride lots, that would increase the all electric range

of PHEVs and potentially provide for “cash back hybrid” power services, as Federal Energy Commissioner Jon Wellinghoff has described. This would in turn provide for additional incentives for transit use.

- Integration with transportation pricing options, such as urban congestion pricing as mitigation for reduced gasoline tax revenues.

Goals: By 2020, XX% of the light-duty vehicle population in Washington would be PHEVs, accounting for YY% of light-duty VMT statewide in that year.

Timing: See above

Parties Involved: State of Washington, Federal energy and transportation agencies, counties and cities, electric power utilities, biodiesel and biofuel farmers and manufacturers, transit agencies, Puget Sound Regional Council.

Implementation Mechanisms

TBD

Related Policies/Programs in Place

[Insert text here]